

```

-----Combining RFM Metrics-----
WITH RecencyCTE AS (
    SELECT
        CustomerID,
        DATEDIFF(DAY, SubscriptionDate, GETDATE()) AS RecencyDays
    FROM Customers
),
FrequencyCTE AS (
    SELECT
        CustomerID,
        1 AS Frequency -- Placeholder for lack of frequency data
    FROM Customers
),
MonetaryCTE AS (
    SELECT
        CustomerID,
        DATEDIFF(DAY, SubscriptionDate, GETDATE()) * 10 AS Monetary -- Proxy metric
    FROM Customers
)
SELECT
    r.CustomerID,
    CONCAT(c.FirstName, ' ', c.LastName) AS CustomerName,
    r.RecencyDays,
    f.Frequency,
    m.Monetary
FROM
    RecencyCTE r
JOIN
    FrequencyCTE f ON r.CustomerID = f.CustomerID
JOIN
    MonetaryCTE m ON r.CustomerID = m.CustomerID
JOIN
    Customers c ON r.CustomerID = c.CustomerID;

```

	CustomerID	CustomerName	RecencyDays	Frequency	Monetary
1	000148537BdB192	Jerry Haas	-83934	1	-839340
2	00048FAE2Bb80dA	Carly Jarvis	-53675	1	-536750
3	0005d7cEB1027FE	Bryan Alexander	-23982	1	-239820
4	0007B71f7e2e55F	Natasha Cantu	-48613	1	-486130
5	000B5Bbcd6a3E90	Jake Valencia	-32776	1	-327760
6	000fA32B31222ef	Judy Johnson	-22161	1	-221610
7	000Fa8Bb8ED7EB3	Jeffery Castaneda	-54353	1	-543530
8	000fb9eD3EDA5Ca	Clifford Luna	-23891	1	-238910
9	00127452495CB49	Mandy Sweeney	-2394	1	-23940
10	00133CbAf0aCa1F	Steven Massey	-83942	1	-839420
11	0013e0Ad71Eab87	Claudia Camey	-52306	1	-523060
12	00186887BCbc190	Martha Colon	-49177	1	-491770
13	0018cAf0a87DeE5	Sophia Curry	-65090	1	-650900
14	001926a50B8Ed8D	Kara Mays	-41753	1	-417530
15	001e5a54Dc0832f	John Home	-67080	1	-670800
16	00207bDea8F07Fa	Kimberly Lloyd	-22968	1	-229680
17	002124884f32C6R	Rent Rumses	-85017	1	-850170

```

-----Segmentation Query Adapted-----
----
-- Step 1: Calculate RFM Metrics using Common Table Expressions (CTEs)
WITH RecencyCTE AS (
    SELECT
        CustomerID,
        DATEDIFF(DAY, SubscriptionDate, GETDATE()) AS RecencyDays
    FROM Customers
),
FrequencyCTE AS (
    SELECT
        CustomerID,
        1 AS Frequency -- Placeholder for frequency if not available
    FROM Customers
),
MonetaryCTE AS (
    SELECT
        CustomerID,
        DATEDIFF(DAY, SubscriptionDate, GETDATE()) * 10 AS Monetary -- Proxy metric for
engagement
    FROM Customers
)

-- Step 2: Combine RFM Metrics into a Unified Table
SELECT
    c.CustomerID,
    CONCAT(c.FirstName, ' ', c.LastName) AS CustomerName,
    r.RecencyDays,
    f.Frequency,
    m.Monetary,
    -- Step 3: Segment Customers Based on RFM Metrics
    CASE
        WHEN r.RecencyDays < 30 AND m.Monetary > 500 THEN 'High-Value'
        WHEN r.RecencyDays > 60 THEN 'At-Risk'
        ELSE 'Other'
    END AS Segment
FROM
    RecencyCTE r
JOIN
    FrequencyCTE f ON r.CustomerID = f.CustomerID
JOIN
    MonetaryCTE m ON r.CustomerID = m.CustomerID
JOIN
    Customers c ON r.CustomerID = c.CustomerID;

```

	CustomerID	CustomerName	RecencyDays	Frequency	Monetary	Segment
1	000148537BdB192	Jerry Haas	-83934	1	-839340	Other
2	00048FAE2Bb80dA	Carly Jarvis	-53675	1	-536750	Other
3	0005d7cEB1027FE	Bryan Alexander	-23982	1	-239820	Other
4	0007B71f7e2e55F	Natasha Cantu	-48613	1	-486130	Other
5	000B5Bbcd6a3E90	Jake Valencia	-32776	1	-327760	Other
6	000fA32B31222ef	Judy Johnson	-22161	1	-221610	Other
7	000Fa8Bb8ED7EB3	Jeffery Castan...	-54353	1	-543530	Other
8	000fb9eD3EDA5Ca	Clifford Luna	-23891	1	-238910	Other
9	00127452495CB49	Mandy Sween...	-2394	1	-23940	Other
10	00133CbAf0aCa1F	Steven Massey	-83942	1	-839420	Other
11	0013e0Ad71Eab87	Claudia Camey	-52306	1	-523060	Other
12	00186887BCbc190	Martha Colon	-49177	1	-491770	Other
13	0018cAf0a87DeE5	Sophia Curry	-65090	1	-650900	Other
14	001926a50B8Ed8D	Kiara Mays	-41753	1	-417530	Other
15	001e5a54Dc0832f	John Home	-67080	1	-670800	Other
16	00207bDea8F07Fa	Kimberly Lovel	-22968	1	-229680	Other

-----Identify Customers with Multiple Contact Numbers-----  
-----

```

SELECT
    Country,
    COUNT(CustomerID) AS CustomersWithMultipleContacts
FROM
    Customers
WHERE
    Phone1 IS NOT NULL AND Phone2 IS NOT NULL
GROUP BY
    Country
ORDER BY
    CustomersWithMultipleContacts DESC;

```

	Country	CustomersWithMultipleContacts
1	Congo	835
2	Korea	820
3	Saudi Arabia	463
4	Pitcairn Islands	456
5	Saint Martin	453
6	Paraguay	445
7	Canada	444
8	American Samoa	443
9	Saint Kitts and Nevis	443
10	Cook Islands	441
11	Mauritania	441
12	Heard Island and ...	440
13	Namibia	439
14	Montenegro	439
15	Guam	438
16	Bolivia	438

-----Domain Analysis for Customer Emails-----

```
SELECT
    RIGHT(Email, LEN(Email) - CHARINDEX('@', Email)) AS EmailDomain,
    COUNT(CustomerID) AS CustomerCount
FROM
    Customers
GROUP BY
    RIGHT(Email, LEN(Email) - CHARINDEX('@', Email))
ORDER BY
    CustomerCount DESC;
```

	EmailDomain	CustomerCount
1	mckee.com	59
2	pugh.com	58
3	lawrence.com	57
4	delgado.com	56
5	terrell.com	56
6	romero.com	56
7	glass.com	55
8	fitzpatrick.com	55
9	rowe.com	54
10	short.com	54
11	thomas.com	54
12	jacobson.com	54
13	pratt.com	54
14	burke.com	54
15	reese.com	54
16	cohen.com	54

-----Analyze Subscription Patterns by Month-----

```
SELECT
    FORMAT(SubscriptionDate, 'yyyy-MM') AS SubscriptionMonth,
    COUNT(CustomerID) AS Subscriptions
FROM
    Customers
GROUP BY
    FORMAT(SubscriptionDate, 'yyyy-MM')
ORDER BY
    Subscriptions DESC;
```

	SubscriptionMonth	Subscriptions
1	2030-12	31
2	2026-08	31
3	2285-12	31
4	2247-01	31
5	2267-03	31
6	2236-01	31
7	2234-05	31
8	2204-07	31
9	2228-05	31
10	2078-07	31
11	2100-12	31
12	2222-03	31
13	2157-01	31
14	2072-03	31
15	2225-03	31
16	2023-07	31

-----Generate Full Customer Contact List-----

```

SELECT
    CustomerID,
    CONCAT(FirstName, ' ', LastName) AS FullName,
    CONCAT(Phone1, ' ', Phone2) AS ContactNumbers,
    Email,
    CONCAT(City, ' ', Country) AS Location
FROM
    Customers
ORDER BY
    FullName ASC;

```

	CustomerID	FullName	ContactNumbers	Email	Location
1	e77c40dFab505df	Aaron Aguirre	7243306415, +1-390-175-4798x865	leah44@cross-young.com	New Dan, Italy
2	1D07142aE2AbCa	Aaron Allison	(196)768-5675, 221-284-6382x176	vcannon@jacobs-meyer.com	North Sheilaport, Tuvalu
3	Db7df5F61691ccD	Aaron Barker	9433538526, 001-224-140-3408x362	bradleyholland@bowen.com	West Desiree, Malaysia
4	acc0b2CBf5CeFD5	Aaron Barnett	+1-394-144-3435x96084, 963-275-7330x57036	xsheman@nicholson.com	Port Jamiehaven, Venezuela
5	A133d2D1abd1F93	Aaron Barrera	-10236, (188)932-8961x55412	jasminbridges@barrera.org	Curtisstad, Tanzania
6	4CDDBed7f5EFBe6	Aaron Bautista	503.259.9308x64215, 746-729-6222x4536	wwalters@little.info	West Meganside, Cameroon
7	8Ab71CeA4dfa3dB	Aaron Baxter	714.840.6126x5689, (215)889-5014	christy87@chase.info	West Haydenfurt, Fiji
8	72a1e6d0374765A	Aaron Beltran	001-117-175-0045x56135, 448.549.7778x5576	malikhodge@liu.net	West Sergioville, French Polynesia
9	9a1D42726C3f3F2	Aaron Benitez	902-337-6137x50145, 005.417.2846	sfisher@benitez.com	South Yolanda, Cape Verde
10	20DDa14d1e6b42d	Aaron Bennett	001-959-822-3757x4737, +1-138-324-6077x1109	hayden65@hamis.org	Natalieville, United Kingdom
11	002afe6E2FbE488	Aaron Berry	001-167-906-3219, 420-024-4990	tashazimmerman@steele.com	Wallermouth, Fiji
12	8c078Fd5E414Cd2	Aaron Bery	(548)745-3372x4869, (438)637-0652	laurie67@odom.com	New Sallyville, Heard Island and McDonald Islands
13	f120CC497CbCA4B	Aaron Blackwell	(625)063-5349x616, 5017051629	dchung@gamer-haynes.com	South Douglas, Iceland
14	27D4b5B448531FC	Aaron Blair	(275)868-2447, 001-753-330-3294	ugarison@leach-rogers.info	Greenbury, Niger
15	eAAb44cbc43AFec	Aaron Boyd	270.417.5467, 206-397-6808	petersonvincent@wilson.net	Morganborough, Anguilla
16	EcbC6dC571FcE5F	Aaron Bradford	184-728-2262x17450, 1278657450	cesarhooper@park.biz	South Adrianaland, Aorentina

-----Country-wise Most Recent Subscriber-----

```

WITH RankedSubscribers AS (
    SELECT
        CustomerID,
        CONCAT(FirstName, ' ', LastName) AS FullName,
        Country,

```

```

        SubscriptionDate,
        ROW_NUMBER() OVER (PARTITION BY Country ORDER BY SubscriptionDate DESC) AS Rank
FROM
    Customers
)
SELECT
    CustomerID,
    FullName,
    Country,
    SubscriptionDate
FROM
    RankedSubscribers
WHERE
    Rank = 1;

```

	CustomerID	FullName	Country	SubscriptionDate
1	2fEa7C072F0933D	Natalie Oliver	Afghanistan	2295-04-25 00:00:00.000
2	9BA21DbE3Da5f48	Kenneth Fleming	Albania	2295-05-13 00:00:00.000
3	06fB0B23fCBcb2A	Omar Lynch	Algeria	2295-02-15 00:00:00.000
4	04d3e8deE9cf262	Glenn Craig	American Samoa	2295-07-17 00:00:00.000
5	147bEdBfaFE83b6	Charlotte Rogers	Andorra	2295-05-27 00:00:00.000
6	EDe8C4eD0AABcDC	Dalton Cobb	Angola	2293-09-09 00:00:00.000
7	acfF1b8559E4674	Tammy Rowland	Anguilla	2294-03-06 00:00:00.000
8	B2d0730089c9F11	Tyrone Bary	Antarctica (the territory South of 60 deg S)	2295-02-27 00:00:00.000
9	cc82CAa14E011be	Lance Glenn	Antigua and Barbuda	2295-04-28 00:00:00.000
10	f3F01bAA4dfE66b	Ricardo Anderson	Argentina	2294-11-10 00:00:00.000
11	9ca52dc1BA95d5e	Alexander Bradley	Amenia	2295-03-01 00:00:00.000
12	F62531d6b8Bab95	Travis Cole	Aruba	2295-04-04 00:00:00.000
13	1b484DbD8A6fa4A	Candace Stuart	Australia	2295-08-20 00:00:00.000
14	4408DA5A186ce1A	Martin Bender	Austria	2295-02-06 00:00:00.000
15	cd8128a9AdFDF3f	Ricardo Gill	Azerbaijan	2292-12-23 00:00:00.000
16	Aa6C05A5FBdAbEd	Mandy Whitaker	Bahamas	2295-04-21 00:00:00.000

-----Scenario: Find the latest subscription date for each country-----

-----Fast Query (Using JOIN and Aggregation)-----

```

SELECT
    C.[ID],
    C.[CustomerID],
    C.[FirstName],
    C.[LastName],
    C.[Company],
    C.[City],
    C.[Country],
    C.[Phone1],
    C.[Phone2],
    C.[Email],
    C.[SubscriptionDate],
    C.[Website]
FROM
    [Health_Food_Flask].[dbo].[Customers] C
INNER JOIN (
    SELECT

```

```

        [Country],
        MAX([SubscriptionDate]) AS MaxSubscriptionDate
FROM
    [Health_Food_Flask].[dbo].[Customers]
GROUP BY
    [Country]
) AS SubQuery ON
    C.[Country] = SubQuery.[Country] AND
    C.[SubscriptionDate] = SubQuery.MaxSubscriptionDate
ORDER BY
    C.[Country];

```

	ID	CustomerID	FirstName	LastName	Company	City	Country	Phone1	Phone2	Email
1	99875	2fEa7C072F0933D	Natalie	Oliver	Malone, Rowland and Bullock	South Elijahberg	Afghanistan	001-277-593-9429	+1-287-745-9958x7723	flynnnatalie@mills-shea.com
2	99893	9BA21D6E3Daf48	Kenneth	Fleming	Conrad-Hanson	Lake Grace	Albania	(291)771-4561	818-921-2658x197	shemi05@mcmillan.info
3	99806	06B0B23fC8cb2A	Omar	Lynch	Conley Group	Krausemouth	Algeria	(935)194-7427x375	(925)313-1291x442	edgardavila@sheman.com
4	99958	04d3e8deE9cf262	Glenn	Craig	Wright, Erickson and Wells	West Mackenziechester	American Samoa	(732)445-1388	504.767.3697	brookekerr@moreno.com
5	99907	147bEdBfaFE83b6	Charlotte	Rogers	Montoya PLC	Chungfurt	Andorra	001-797-695-4063x1652	974-276-6732x4201	halley45@levine.org
6	99282	EDe9C4eD0AA8cDC	Dalton	Cobb	Salinas PLC	New Crystal	Angola	032.803.5124x1184	(531)983-4467	jackiecurry@good-collins.cor
7	99460	acdf1b8559E4674	Tammy	Rowland	Bond Inc	Cassandraport	Anguilla	(830)869-5444	-6531	franklin30@weiss-avery.net
8	99818	B2d0730089c9F11	Tyrone	Barry	Tapia Inc	Clarenceland	Antarctica (the territory South of 60 deg S)	001-214-589-0142	+1-330-014-6941x7416	marcia50@sawyer.biz
9	99878	cc82CaA14E011be	Lance	Glenn	Holmes-Walls	North Stacey	Antigua and Barbuda	064.639.0568x288	489.505.9452	jeanne25@hiley.com
10	99709	f3f01bAA4dfe6Bb	Ricardo	Anderson	Hampton-Malone	Calvinside	Argentina	7070681344	191-746-8596x957	yvonne95@grimes-glass.com
11	99820	9ca52dc1BA95d5e	Alexander	Bradley	Brooks, Gross and Miller	Bondhaven	Armenia	+1-366-381-9463x67460	001-849-216-3505x5555	cammentodd@dalton-mcdow
12	99854	F62531d6b8Bab95	Travis	Cole	Morgan LLC	South Lauraland	Aruba	001-870-424-9489x2771	503-289-3282x29819	mccarthy@pham-gallegos.ci
13	99992	1b484DbD8A6fa4A	Candace	Stuart	Velasquez, Gregory and Tran	Selenaborough	Australia	912-022-3582	-3532	kennedyshawn@gutierrez.cc
14	99797	4408DA5A186ce1A	Martin	Bender	Duke-Ellis	Annemouth	Austria	+1-869-028-7640x129	065.782.2280x02006	kathleen26@erickson.com
15	99022	cd8128a9AdFDF3f	Ricardo	Gill	Holland, Wilson and Mills	Nicholsonmouth	Azerbaijan	001-521-018-9996	125.328.9642x96984	drew59@singh.com

-----Slow Query (Using HAVING with Correlated Subquery)-----

```

SELECT
    [ID],
    [CustomerID],
    [FirstName],
    [LastName],
    [Company],
    [City],
    [Country],
    [Phone1],
    [Phone2],
    [Email],
    [SubscriptionDate],
    [Website]
FROM
    [Health_Food_Flask].[dbo].[Customers] C1
GROUP BY
    [ID],
    [CustomerID],
    [FirstName],
    [LastName],
    [Company],
    [City],
    [Country],
    [Phone1],
    [Phone2],
    [Email],
    [SubscriptionDate],
    [Website]
HAVING

```

```

[SubscriptionDate] = (
    SELECT
        MAX([SubscriptionDate])
    FROM
        [Health_Food_Flask].[dbo].[Customers] C2
    WHERE
        C2.[Country] = C1.[Country]
)
ORDER BY
    [Country];

```

	ID	CustomerID	FirstName	LastName	Company	City	Country	Phone1	Phone2	Email
1	99875	2fEa7C072F0933D	Natalie	Oliver	Malone, Rowland and Bullock	South Elijahberg	Afghanistan	001-277-593-9429	+1-287-745-9958x7723	flynnnatalie@mills-shea.com
2	99893	9BA21D6E3Da5f48	Kenneth	Fleming	Conrad-Hanson	Lake Grace	Albania	(291)771-4561	818-921-2658x197	shem05@mcmillan.info
3	99806	09f80B23fCBcb2A	Omar	Lynch	Conley Group	Krausemouth	Algeria	(935)194-7427x375	(925)313-1291x442	edgardavila@sheman.com
4	99958	04d3e8deE9cf262	Glenn	Craig	Wright, Erickson and Wells	West Mackenziechester	American Samoa	(732)445-1388	504.767.3697	brookekerr@moreno.com
5	99907	147bEd8faFE83b6	Charlotte	Rogers	Montoya PLC	Chungfurt	Andorra	001-797-695-4063x1652	974-276-6732x4201	hailey45@levine.org
6	99282	EDe9C4eD0AABcDC	Dalton	Cobb	Salinas PLC	New Crystal	Angola	032.803.5124x1184	(531)983-4467	jackiecury@good-collins.com
7	99460	acFF1b0559E4674	Tammy	Rowland	Bond Inc	Cassandraport	Anguilla	(830)869-5444	-6531	franklin30@weiss-avery.net
8	99818	B2d0730089c9F11	Tyrone	Barry	Tapia Inc	Clarenceland	Antarctica (the territory South of 60 deg S)	001-214-589-0142	+1-330-014-6941x7416	marcia50@sawyer.biz
9	99878	cc82CAa14E011be	Lance	Glenn	Holmes-Walls	North Stacey	Antigua and Barbuda	064.639.0568x288	489.505.9452	jeanne25@riley.com
10	99709	f3F01bAA4df66b	Ricardo	Anderson	Hampton-Malone	Calvinside	Argentina	7070681344	191-746-9596x957	yvonne95@grimes-glass.com
11	99820	9ca52dc1BA95d5e	Alexander	Bradley	Brooks, Gross and Miller	Bondhaven	Armenia	+1-366-381-9463x67460	001-849-216-3505x5555	camentodd@dalton-mcdowe
12	99854	F62531d6b8Bab95	Travis	Cole	Morgan LLC	South Lauraland	Aruba	001-870-424-9489x2771	503-289-3282x29819	mccarthy@pham-gallegos.cc
13	99992	1b484DbD8A6fa4A	Candace	Stuart	Velasquez, Gregory and Tran	Selenaborough	Australia	912-022-3582	-3532	kennedyshawn@gutierrez.co
14	99797	4408DA5A186ce1A	Martin	Bender	Duke-Ellis	Annemouth	Austria	+1-869-028-7640x129	065.782.2280x02006	kathleen26@erickson.com
15	99022	cd8128a9AdFDF3f	Ricardo	Gill	Holland, Wilson and Mills	Nicholsonmouth	Azerbaijan	001-521-018-9996	125.328.9642x96984	drew59@singh.com